

CHAPTER 1
INTRODUCTION

1-1. PURPOSE. Based on the range training requirements of TC 25-8, this manual provides generic design guidance and required interface points for the following range designs:

- a. Tank gunnery range (stationary).
- b. Multipurpose training range (MPTR).
- c. Antiarmor tracking and live fire (AATLF) range.
- d. Multipurpose range complex (MPRC).
- e. Multipurpose range complex, light infantry (MPRC-LI).
- f. Automated field fire range (AFF).
- g. Modified record fire range (MRF).
- h. Automated record fire range (ARF).
- i. Fire and movement range.
- j. Sniper training field fire range.
- k. Multipurpose machinegun transition range (MPMG).
- l. Combat pistol qualification course (CPQC).
- m. Infantry squad battle course (ISBC).
- n. Infantry platoon battle course (IPBC).
- o. Military operations on urbanized terrain (MOUT) training complex.

This manual (1) identifies specific interface points between the remotored target system (RETS) targetry contractor and the range construction contractor, (2) facilitates the standardization of range facilities, and (3) notes salient points and design criteria for standardized ranges.

1-2. APPLICABILITY. This manual applies to anyone involved in designing and planning the ranges listed in paragraph 1-1 above.

1-3. REFERENCES. References cited in this manual are listed in appendix A.

1-4. EXPLANATION OF ABBREVIATIONS. Abbreviations used in this manual are explained in the glossary.

1-5. GENERIC DESIGN INFORMATION.

a. Design Criteria. The ranges presented in this manual use RETS equipment, which includes computer-operated and -controlled stationary and moving target devices and simulation equipment. This manual addresses the following topics:

- (1) Electrical and control interfaces required by target simulators and the control equipment.
- (2) Range control tower and miscellaneous support buildings.
- (3) A narrative description of each range.
- (4) Layouts for each type of range, including distances, firing points, target locations, and defilade positions.
- (5) Recommended electrical power distribution for each type of range and for support facilities, the control tower, and downrange devices.
- (6) Data cable distribution for each type of range.
- (7) Communications requirements.
- (8) Area lighting systems.
- (9) Lightning protection for all applicable facilities and target emplacements.
- (10) Tank trail design and dust control.
- (11) Protection of target mechanisms.
- (12) Typical RETS target emplacements.

b. DD Form 1391. The sample of DD Form 1391 in appendix B uses mock data to provide a generic guide for facility planning. This is only a guide. Site specific 1391's must be developed.

c. Site Survey Scope of Work. The sample site survey scope of work in appendix C can be used by surveyors as a generic guide for obtaining data needed for design work.

d. Specifications. The outline specifications in appendix D list the Corps of Engineers Guide Specifications (CEGS) that would apply to the generic design drawings.

e. Quality Assurance Guide (QAG). The designer can use the QAG, Part III, in appendix E to check the interface points of site-specific designs.

f. Design Drawings. Appendix F includes the generic standard design drawings for range layouts, wiring plans, target mechanism emplacements, support facilities, and other ancillary items. The drawings are also available in .pdf and .dgn formats through the internet as explained in appendix F.

1-6. INTERFACE POINTS. The following interfaces must be adhered to by the designer so that RETS equipment can be installed and function properly. To check the interface points of site-specific designs, the designer can use the QAG in appendix E.

- a. Target mechanism emplacement wall heights and dimensions.
- b. Armor target moving carrier (AMTC) roadbed and wall height.
- c. Power, data, and control equipment configuration for the AMTC system.
- d. Data cable breakout box (DBB) for armor ranges only.
- e. Target mechanism emplacement cable junction box (CJB).
- f. Tower junction box (TJB).
- g. Signal distribution assembly (SDA) mounting supports and power circuit.
- h. Wireway to interconnect SDA with processor, monitor, and printer.
- i. Power and data cables. 480-volt, 3-phase panelboard in the AMTC system.
- j. Grounding.
- k. Contol tower lightning protection.

1-7. SITE ADAPTATION.

- a. Interface Requirements. Except for the required design interfaces described in paragraph 1-6 above and in the range layouts, information provided in this manual is only recommended design guidance. Therefore, as long as the required interfaces are adhered to, the facility designer is responsible for adapting the information in this manual to a particular site.
- b. Projectile Consideration. The thickness of protective berms on structures in the downrange area must be site adapted based on the projectiles that will actually be fired and on berm materials available locally.
- c. Site Development. Site development of the range requires site-specific analysis and evaluation, such as land surveys and foundation investigations, in order to achieve realism with minimal site disturbance. The goal is to maintain a natural terrain while incorporating the equipment and buildings needed for the ranges.

d. Line-of-Site Analysis. All targets and firing positions must be site adapted, and a graphical and/or numerical line-of-sight analysis must be performed for all targets and firing positions. The line-of-sight shots should be taken from the height of the gun barrel at the firing position to a point 300-millimeters (1-foot) above the front wall of the target emplacement. In order to verify any changes during design, a line-of-sight analysis must be completed before or concurrent with the 35-percent design and also at the final design stage. The line-of-sight analysis must be based on a minimum 1/2-meter for metric (or 1-foot for English) contour interval topographic survey of the site. (See appendix C for a sample site survey scope of work.)

1-8. ENVIRONMENTAL REQUIREMENTS. Before the selection of a specific training facility location is finalized, the natural and historical resources survey and the environmental assessment/environmental impact statement must be completed in order to comply with the National Environmental Policy Act. Therefore, the designer should coordinate with the installation environmental coordinator throughout the planning, design, and construction phases. As a minimum, the designer must verify that the project is part of the installation current land-use requirements study (which is in accordance with AR 210-21 and TC 25-1) and that an evaluation of compliance has been performed during the planning phase.

1-9. TRAINING REQUIREMENTS. Close coordination between the designers and the trainers throughout the design process is recommended in order to ensure that specific training requirements are met.